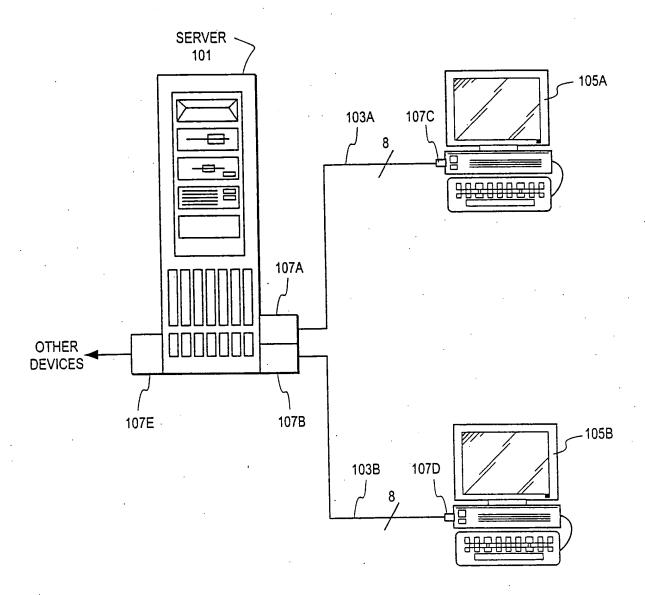
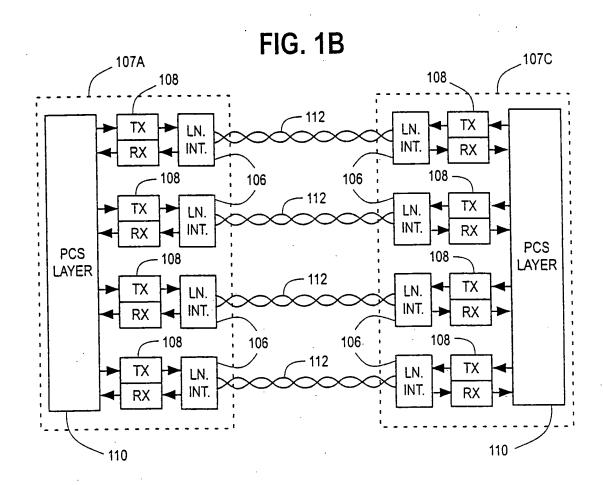
TITLE: GIGABIT ETHERNET TRANSCEIVER WIT ANALOG FRONT END INVENTOR: BEHZAD APPLICATION NO.: UNASSIGNED, CONF. NO. ; DOCKET NO. 13432US05 ATTORNEY: JAW, PHONE: 312-775-8000

FIG. 1A



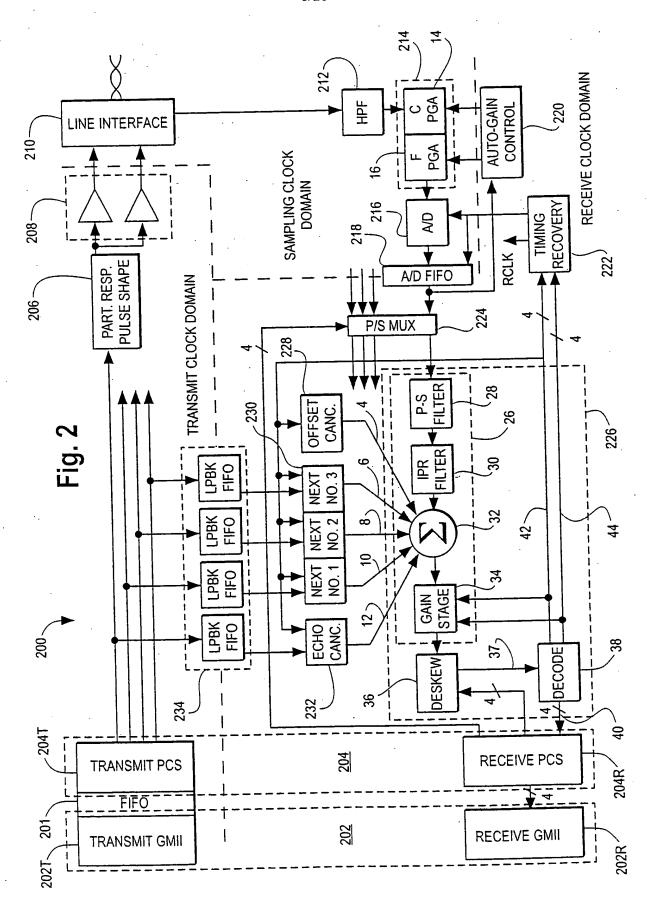
TITLE: GIGABIT ETHERNET TRANSCEIVER WIT ANALOG FRONT END . INVENTOR: BEHZAD APPLICATION NO.: UNASSIGNED, CONF. NO. ; DOCKET NO. 13432US05 ATTORNEY: JAW, PHONE: 312-775-8000



TITLE: GIGABIT ETHERNET TRANSCEIVER WIT ANALOG FRONT END

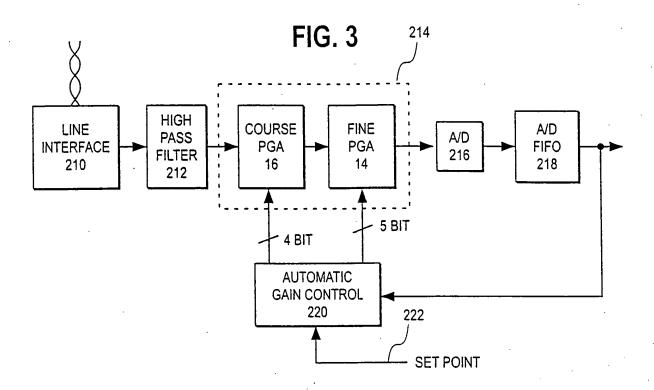
INVENTOR: BEHZAD

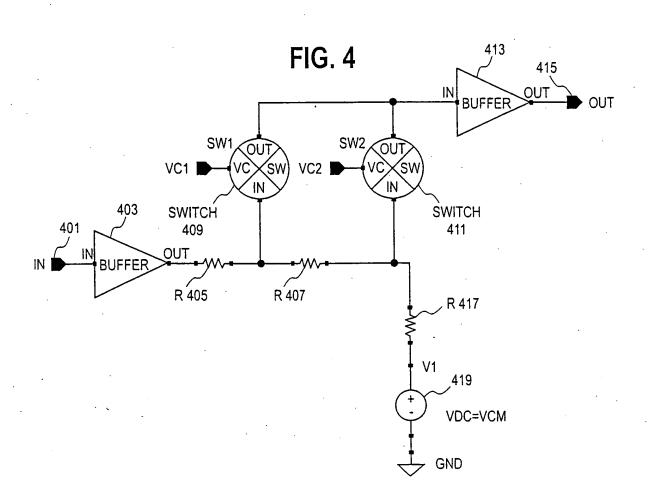
APPLICATION NO.: UNASSIGNED, CONF. NO. ; DOCKET NO. 13432US05 ATTORNEY: JAW, PHONE: 312-775-8000



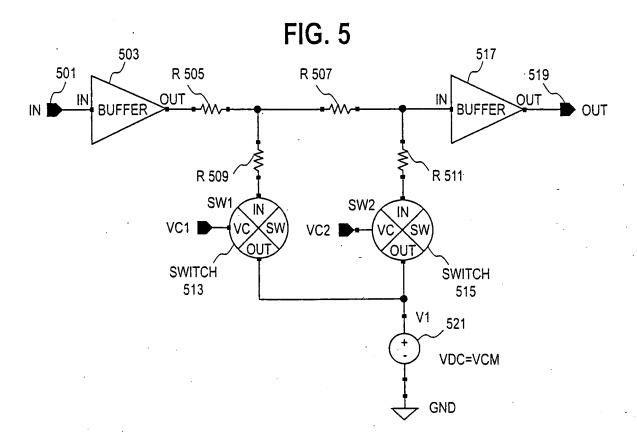
TITLE: GIGABIT ETHERNET TRANSCEIVER WIT ANALOG FRONT END INVENTOR: BEHZAD APPLICATION NO.: UNASSIGNED, CONF. NO. : DOCKET NO. 13432US05

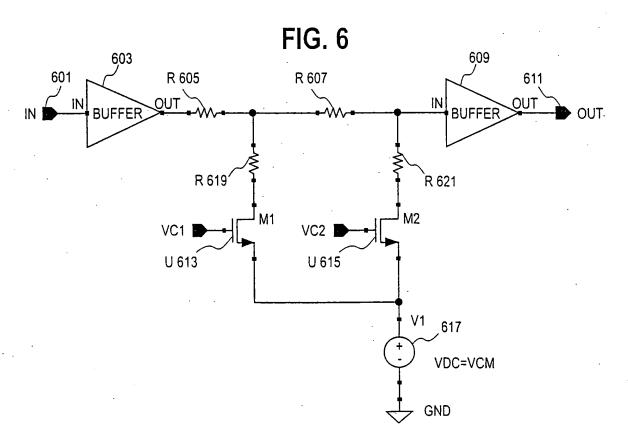
CONF. NO. ; DOCKET NO. 13432US05 ATTORNEY: JAW, PHONE: 312-775-8000



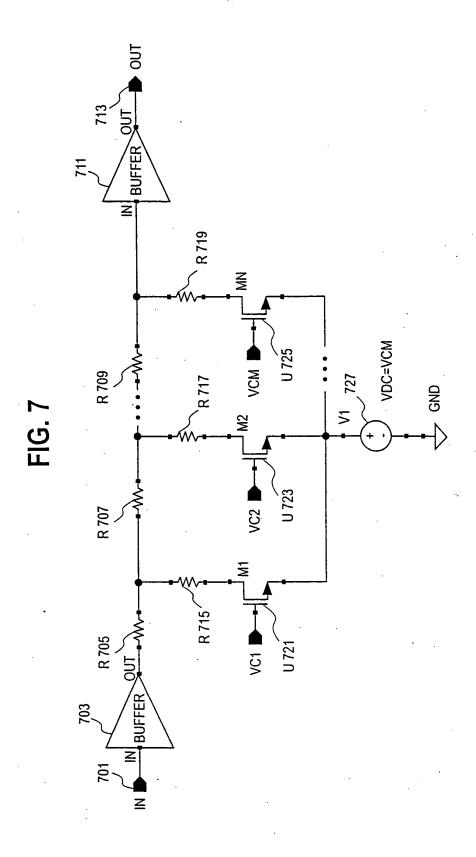


TITLE: GIGABIT ETHERNET TRANSCEIVER WIT ANALOG FRONT END INVENTOR: BEHZAD APPLICATION NO.: UNASSIGNED, CONF. NO. ; DOCKET NO. 13432US05 ATTORNEY: JAW, PHONE: 312-775-8000





TITLE: GIGABIT ETHERNET TRANSCEIVER WIT ANALOG FRONT END INVENTOR: BEHZAD APPLICATION NO.: UNASSIGNED, CONF. NO. ; DOCKET NO. 13432US05 ATTORNEY: JAW, PHONE: 312-775-8000



TITLE: GIGABIT ETHERNET TRANSCEIVER WIT ANALOG FRONT END APPLICATION NO.: UNASSIGNED, CONF. NO. ; DOCKET NO. 13432US05 DOCKET NO. 13432US05 ATTORNEY: JAW, PHONE: 312-775-8000 OUT 7/28 BUFFER Z VDC=VCM 819 GND J SLICES Z. R 809 R 815' N STAGES PER SLICE **R** 823 R 807 R 813' R 811 U 819 R 805 817 BUFFER

TITLE: GIGABIT ETHERNET TRANSCEIVER WIT ANALOG FRONT END INVENTOR: BEHZAD APPLICATION NO.: UNASSIGNED, CONF. NO. ; DOCKET NO. 13432US05 ATTORNEY: JAW, PHONE: 312-775-8000

FIG. 9
PRIOR ART

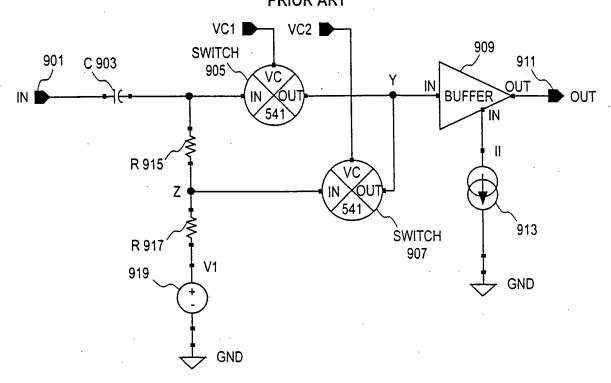
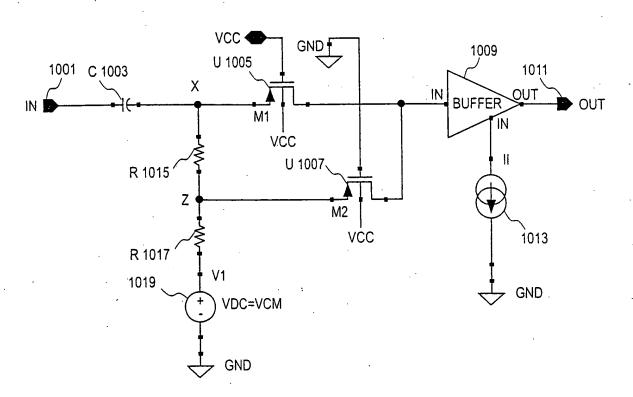
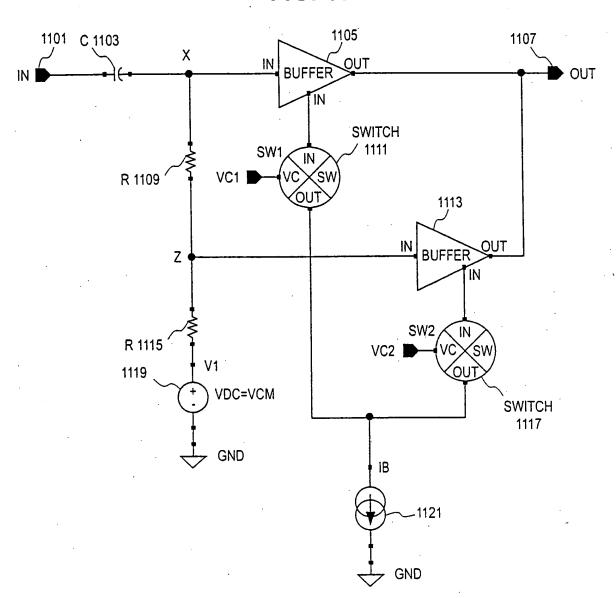


FIG.10 PRIOR ART



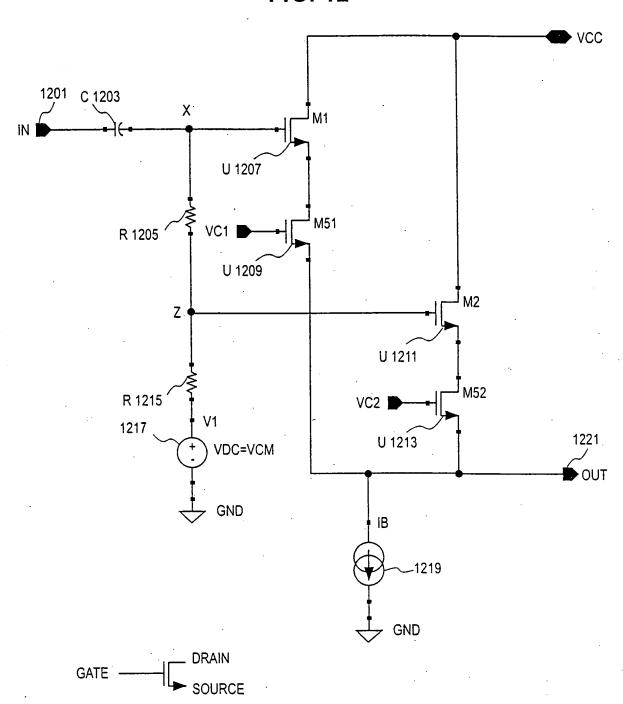
TITLE: GIGABIT ETHERNET TRANSCEIVER WIT ANALOG FRONT END' INVENTOR: BEHZAD APPLICATION NO.: UNASSIGNED CONF. NO. ; DOCKET NO. 13432US05 ATTORNEY: JAW, PHONE: 312-775-8000

FIG. 11



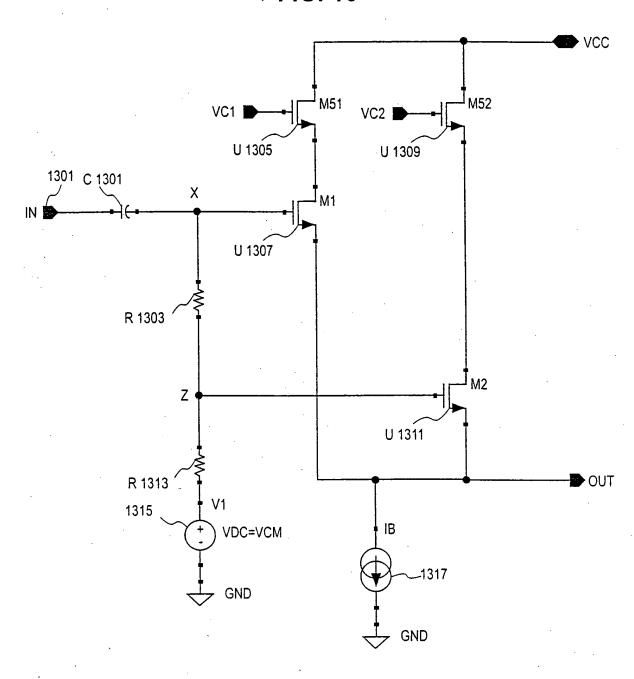
TITLE: GIGABIT ETHERNET TRANSCEIVER WITH ANALOG FRONT END INVENTOR: BEHZAD APPLICATION NO.: UNASSIGNED, CONF. NO. ; DOCKET NO. 13432US05 ATTORNEY: JAW, PHONE: 312-775-8000

FIG. 12



TITLE: GIGABIT ETHERNET TRANSCEIVER WITH ANALOG FRONT END INVENTOR: BEHZAD APPLICATION NO.: UNASSIGNED, CONF. NO. ; DOCKET NO. 13432US05 ATTORNEY: JAW, PHONE: 312-775-8000

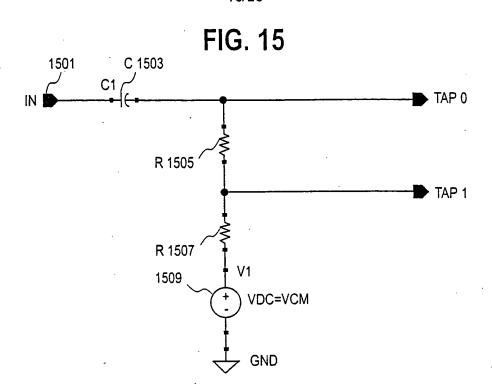
FIG. 13

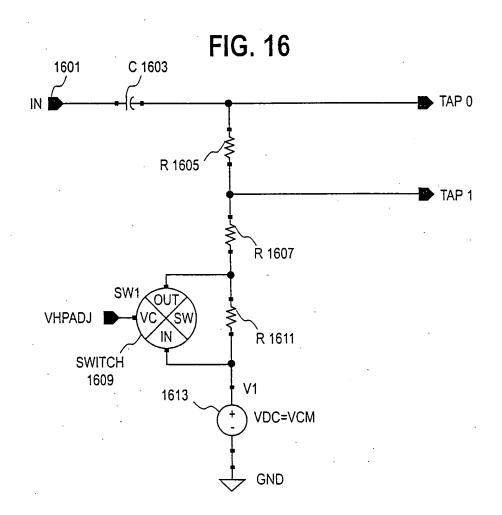


TITLE: GIGABIT ETHERNET TRANSCEIVER WITH ANALOG FRONT END INVENTOR: BEHZAD APPLICATION NO.: UNASSIGNED, CONF. NO. ; DOCKET NO. 13432US05 ATTORNEY: JAW, PHONE: 312-775-8000 12/28 ΗZ U 1419 U 1415 U 1413 JM52 VC2 GND U 1407 VDC=VCM SP 7 R 1925 R 1927 R 1923 R 1921

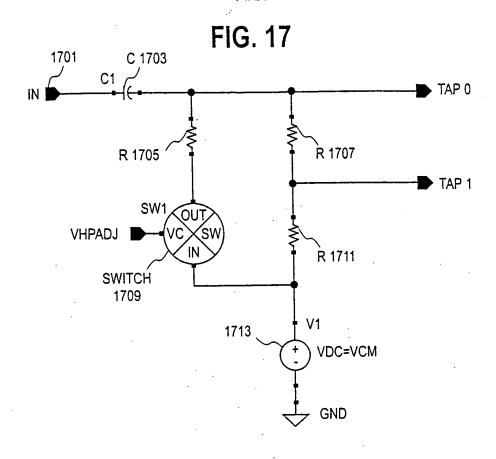
TITLE: GIGABIT ETHERNET TRANSCEIVER WITH ANALOG FRONT END INVENTOR: BEHZAD

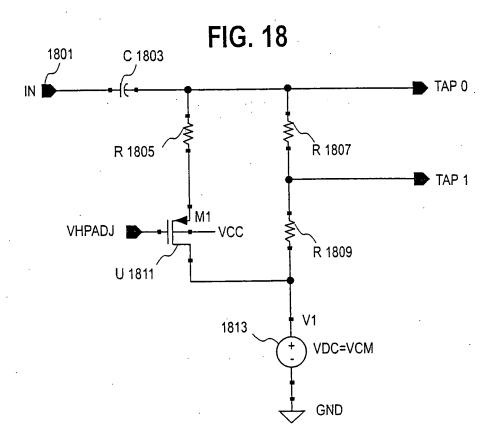
APPLICATION NO.: UNASSIGNED, CONF. NO. ; DOCKET NO. 13432US05 ATTORNEY: JAW, PHONE: 312-775-8000





TITLE: GIGABIT ETHERNET TRANSCEIVER WITH ANALOG FRONT END-INVENTOR: BEHZAD APPLICATION NO.: UNASSIGNED, CONF. NO. ; DOCKET NO. 13432US05 ATTORNEY: JAW, PHONE: 312-775-8000

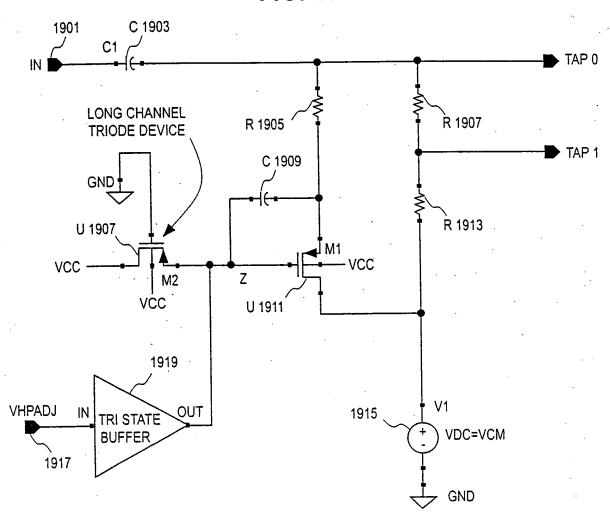




TITLE: GIGABIT ETHERNET TRANSCEIVER WITH ANALOG FRONT END INVENTOR: BEHZAD

APPLICATION NO.: UNASSIGNED, CONF. NO. ; DOCKET NO. 13432US05 ATTORNEY: JAW, PHONE: 312-775-8000

FIG. 19



TITLE: GIGABIT ETHERNET TRANSCEIVER WITH ANALOG FRONT END INVENTOR: BEHZAD APPLICATION NO.: UNASSIGNED, CONF. NO. ; DOCKET NO. 13432US05 ATTORNEY: JAW, PHONE: 312-775-8000 16/28 TAP 0 VDC=VCM R 2009 R 2021 GND Ξ 200 2031 R 2007 U 2019 CIM OUT LONG CHANNEL TRIODE DEVICE **TRI STATE** BUFFER FIG. 20 200 Z 2027 VHPADJ M19 C 2013 R 2005 U 2015 LONG CHANNEL TRIODE DEVICE M21 2025 TRI STATE BUFFER es on the second U 2011 Z 22 VHPADJN Z

APPLICATION NO.: UNASSIGNED, CONF. NO. ; DOCKET NO. 13432US05 ATTORNEY: JAW, PHONE: 312-775-8000 17/28 2135 Z BUFF BUFFER RI 5 Z R 2117 SW6 2131 **R**6 R5 R 2113 **R**4 R 2111 83 R 2109 VC2 R2R 2107 2121 VC1 Ξ **JO** BUFF

z

TITLE: GIGABIT ETHERNET TRANSCEIVER WITH ANALOG FRONT END INVENTOR: BEHZAD

FIG. 21 PRIOR ART

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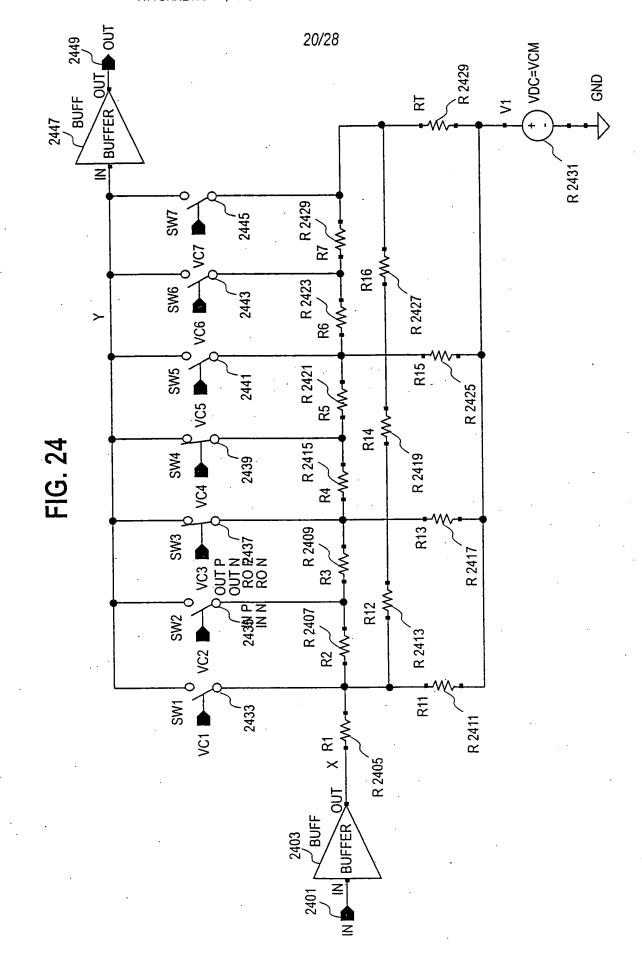
FIG. 22

TITLE: GIGABIT ETHERNET TRANSCEIVER WITH ANALOG FRONT END INVENTOR: BEHZAD APPLICATION NO.: UNASSIGNED, CONF. NO. ; DOCKET NO. 13432US05 ATTORNEY: JAW, PHONE: 312-775-8000 19/28 GND BUFF BUFFER R Z R 2323 SW6 . 80 R15 SW5 R 2321 R 2321 **R**5 R 2317 R14 SW4 R 2319 **R**4 R 2313 R13 R 2315 **V**C3 R3 R 2309 R12 2333 R 2311 VC2 82 **R**4 SW1 2331 VC1 $\frac{8}{2}$ R 2305 JU J

 \mathbf{Z}

TITLE: GIGABIT ETHERNET TRANSCEIVER WITH ANALOG FRONT END INVENTOR: BEHZALD

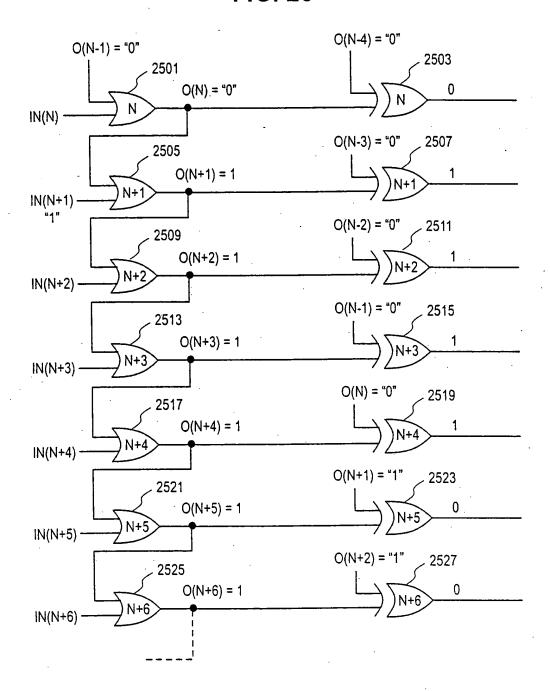
APPLICATION NO.: UNASSIGNED, CONF. NO. ; DOCKET NO. 13432US05 ATTORNEY: JAW, PHONE: 312-775-8000



TITLE: GIGABIT ETHERNET TRANSCEIVER
WITH ANALOG FRONT END
INVENTOR: BEHZAD
APPLICATION NO LINASSICNED

APPLICATION NO.: UNASSIGNED, CONF. NO. ; DOCKET NO. 13432US05 ATTORNEY: JAW, PHONE: 312-775-8000

FIG. 25



WITH ANALOG FRONT END INVENTOR: BEHZAD APPLICATION NO.: UNASSIGNED, CONF. NO. ; DOCKET NO. 13432US05 ATTORNEY: JAW, PHONE: 312-775-8000 22/28 C 0 C = 45F C 1 C = 45F 464 OHM = 14 * 32 + 32/2 VC<20:23> VCC PSS PNPN NPN GND 0 ٥z ZZ R 0 : 464 R3 = 464 11 \propto OUT P ROP NON VC<16:19> VCC GND 0 ٥Z 2617 SOUT N SO P 2509 VC<28:31> VCC GND 0 VC<12:15> VCC ROUT N ٥z ZZ GND 0 2615 ٩z zz 2607 GND 0 VC<24:27> VC<8:12> VCC SOUT N N N N N N ٩z GND 0 ZZ a.z a.z 2613 2605 22 OZOZ 2255 VC<4:7> ۵z ZZ SOUT N ROPN VC<0:31> GND 0 z Z 200 VC<0:3>

TITLE: GIGABIT ETHERNET TRANSCEIVER

FIG. 26

TITLE: GIGABIT ETHERNET TRANSCEIVER WITH ANALOG FRONT END INVENTOR: BEHZAD APPLICATION NO.: UNASSIGNED, CONF. NO. ; DOCKET NO. 13432US05 ATTORNEY: JAW, PHONE: 312-775-8000

FIG. 27

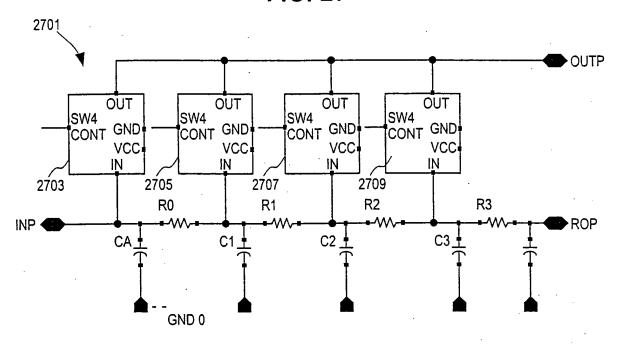
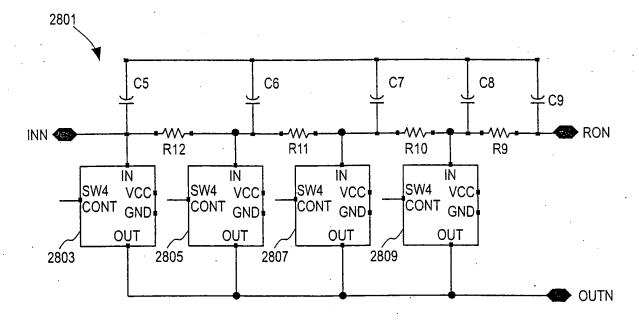


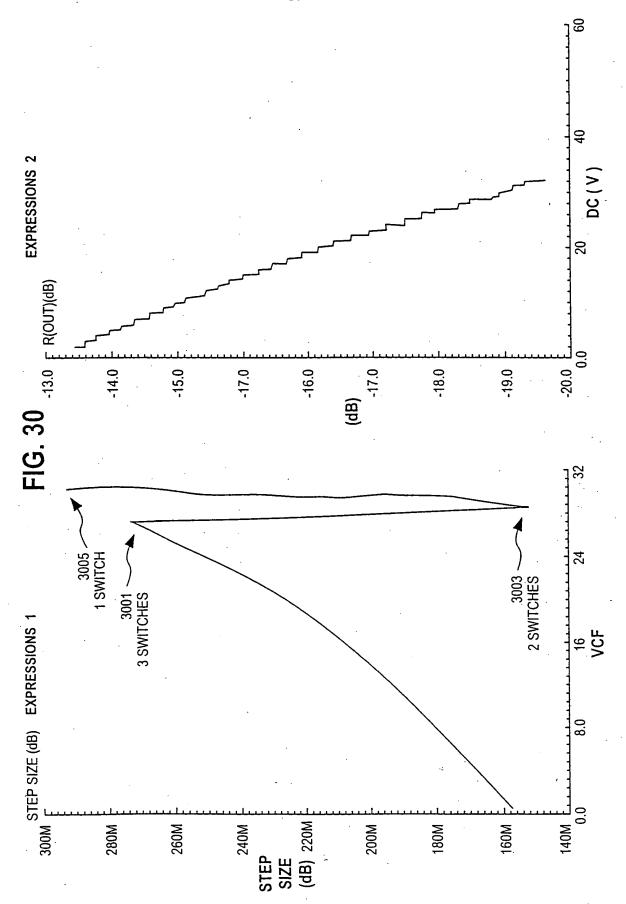
FIG. 28



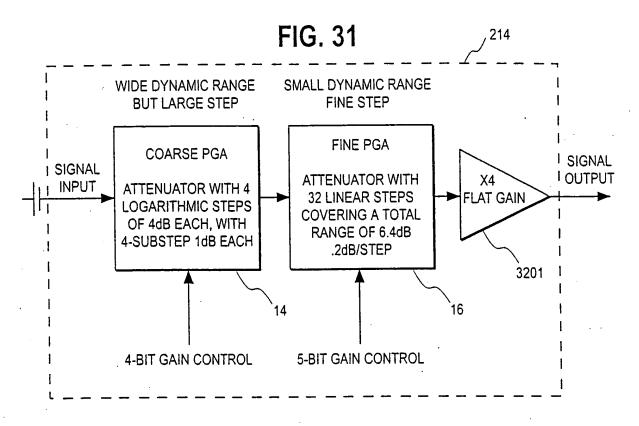
TITLE: GIGABIT ETHERNET TRANSCEIVER WITH ANALOG FRONT END INVENTOR: BEHZAD APPLICATION NO.: UNASSIGNED, CONF. NO. ; DOCKET NO. 13432US05 ATTORNEY: JAW, PHONE: 312-775-8000 24/28 4SWI 1 FREQUENCY RESPONSE 1 SWITCH ON (EFFECT ON BW) 2901 100M 2903 10M ₹ (dB)-40 -30 -50 9 2. -19 -20 MEASURED EXPRESSIONS 16 VCF **DB10 MHZ GAIN DB MAX GAIN 1DBHPBW** 3DB - BW 3DBHPBW DBIPBW **3DBIPBW** 8.0 4.930M 4.870M 4.810M 70.0M 240M 180M -16.0 8.80M 8.60M 160M 110M 120M 170M -13.0 8.40

TITLE: GIGABIT ETHERNET TRANSCEIVER WITH ANALOG FRONT END INVENTOR: BEHZAD APPLICATION NO.: UNASSIGNED, CONF. NO. ; DOCKET NO. 13432US05 ATTORNEY: JAW, PHONE: 312-775-8000





TITLE: GIGABIT ETHERNET TRANSCEIVER WITH ANALOG FRONT END INVENTOR: BEHZAD APPLICATION NO.: UNASSIGNED, CONF. NO. ; DOCKET NO. 13432US05 ATTORNEY: JAW, PHONE: 312-775-8000



PGA GAIN (dB)

10

COARSE PGA GAIN SETTINGS

FINE PGA GAIN SETTINGS

GAIN CONTROL WORD

TITLE: GIGABIT ETHERNET TRANSCEIVER
WITH ANALOG FRONT END
INVENTOR: BEHZAD
APPLICATION NO.: UNASSIGNED,
CONF. NO. ; DOCKET NO. 13432US05 ATTORNEY: JAW, PHONE: 312-775-8000 27/28 **COARSE GAIN FAGCOVFLW FINE GAIN** 3321 **U**5.0 3328 LOAD LOAD COARSE GAIN CONTROL FINE GAIN CONTROL U19.15 U23.18 3319 3325 SELECT SELECT 0 MUX 3323 3317 0 NOTE 2 NOTE 1 NOTE 2: SATURATES AT LEVELS 2^{23} -1 AND 0, AND SETS FAGCOVFLW UPON SATURATION NOTE3: FAGCOVFLW IS RESET ONLY BY FAGCRST 7X2¹⁵ 15X2¹⁸ 3315 ERROR FIG. 33 3309 3313 U14.7 LOAD SELECT ΜX Z-128 3307 CLEAR (CAGCRST II ~ CAGCFRZ) && AGCSAMPO (FAGCRST II ~ FAGCFRZ) && AGCSAMPO NOTE 1: SATURATES AT LEVELS 2¹⁹-1 AND 0 **U14.7** 3303 3305 \equiv 3311 \$8.7 3301 REF. LEVEL (22) AD FIFO OUT (216) AGCSAMPO CAGCHIGEAR CAGCRST **FAGCRST**

TITLE: GIGABIT ETHERNET TRANSCEIVER WIT ANALOG FRONT END INVENTOR: BEHZAD

APPLICATION NO.: UNASSIGNED, CONF. NO. ; DOCKET NO. 13432US05 ATTORNEY: JAW, PHONE: 312-775-8000

28/28

FIG. 34

CABLE LENGTH (m)	100 BASE- TX	GIGABIT, 100 OHM	GIGABIT, 85 OHM	GIGABIT, 115 OHM
0	3.691281	4.193192	4.193192	4.193192
20	3.806628	4.501316	4.362110	4.291369
40	3.877284	4.528136	4.457336	4.429949
60	3.894216	4.733644	4.695307	4.646305
80	4.055372	4.878569	4.847844	4.810019
100	4.225522	4.983545	4.991296	4.968900
120	4.357733	5.134131	5.194401	5.154263
140	4.556012	5.266919	5.380943	5.366309
160	4.764462		-	•

TARGET E{IXI} = A/D CLIPPING LEVEL X (E{IXI}/RMS)/(PEAK/RMS) = $127 \times 0.7979/5.2 = 20$